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the path cuts all the lines of greatest slope at the constant angle β. Find the work done in attaining the summit.

[Problem 11, page 226, *Johnson's Theoritical Mechanies.*]

179. Proposed by F. P. MATZ, Sc. D., Ph. D., Reading, Pa.

If the *velocity* of a body moving under an acceleration tending to the center *varies* as the radius of curvature, the body will describe a cycloid.

MISCELLANEOUS.

148. Proposed by F. P. MATZ, Ph. D., Sc. D., Reading, Pa.

Given $\sin 3\phi+\cos3\phi=m$............(1), and $\cos\phi-\sin\phi=x$..............(2), to find x extremes of m.

AVERAGE AND PROBABILITY.

163. Proposed by R. D. CARMICHAEL, Hartselle. Ala.

In a regular n-gon a triangle is formed by taking three vertices at random. What is the mean value of the triangle.

164. Proposed by J. O. Mahoney, B. E., M. Sc., Central High School, Dallas. Texas.

If m is prime, and the numbers 0, 1, 2, 3,.................., m^2-1 are placed at random in the form of a square, the probability that the square is *hyper-magic* is

$$\frac{(m-1)\,m}{(m^2-2)\,!}$$

NOTE.—Problems and solutions in the departments of Geometry, Calculus, Mechanics, and Average and Probability should be sent to B. F. Finkel; and those in the departments of Algebra, Diophantine Analysis, Miscellaneous, and Group Theory should be sent to Dr. Saul Epsteen. Our contributors should carefully observe this notice if proper credit for contributions is to be given.

NOTES.

The Chicago Section of the American Mathematical Society met in Chicago on April 29. E.

Mr. Newton Ensign, of McKendree College, a student of our well known contributor Prof. G. W. Greenwood, was awarded the Rhodes Scholarship for Illinois. He will pursue the honor mathematical course at Oxford University. E.

The Open Court Publishing Co., of Chicago, has just issued a portfolio of twelve portraits of eminent mathematicians, edited by Professor David Eugene Smith. It includes the portraits of DeCartes, Pythagoras, Archimedes, Fermat, Leonardo of Pisa, Euclid, Leibnitz, Napier, Vieta, Newton, Thales. The portraits are printed by a photographic process, and are issued in two forms, the first on Japanese paper, the price of which is $5, and the second on plate paper, at $3. The originals are from Professor Smith's large collection. With each portrait is a biographical note introducing a brief biography. E.

Editor Finkel has been appointed to a Harrison Fellowship in the University of Pennsylvania for the year 1905-1906. The Board of Trustees of Drury College has granted him a year's leave of absence and he will spend the coming year in study in Philadelphia. Mr. O. E. Glenn, Fellow in Mathematics in the University of Pennsylvania, has been appointed Acting Professor of Mathematics and Physics during his absence.

Dr. Edward Kasner has been promoted to an instructorship in Mathematics in Barnard College, Columbia University.

Professor E. B. VanVleck, of Wesleyan University has received leave of absence and will spend the year abroad.

Professor L. W. Dowling, of the University of Wisconsin, has been granted leave of absence and will spend the coming year mainly in Italy.

Mr. W. H. Roever has been appointed Instructor in Mathematics at the Massachusetts Institute of Technology.

BOOKS AND PERIODICALS.

The Secret of the Circle and the Square. By J. C. Willmon. 12 mo. Cloth, 30 pages. Los Angeles, California: Published by the Author.

This little volume should not be consigned to the junk-pile of literature treating on successful (?) circle-squaring and angle trisecting, as one might infer from its title. The author states in his preface that it is his intention "to demonstrate the possibility of constructing a straight line equal to any given arc of a circle, and through this problem to construct a square equal in area to any circle and a circle equal in area to any square, with solutions of kindred geometrical problems." The constructions are simple, though only approximate, but may, by the method given, be carried out to any desired degree of accuracy. B. F. F.

Plane and Spherical Trigonometry. By P. A. Lambert, Assistant Professor of Mathematics, Lehigh University, and H. A. Foering, Head Master of Bethlehem Preparatory School. 8vo. Cloth, 104 pages. Price, 60 cents. New York: The Macmillan Co.

This text-book gives about the amount of material required of the average college student. The definitions of the functions are given by means of projection, a feature that